Vol. 2 No. 10 OCTOBER 1984

DATA BRIEFS...

○ **Waiting for MSX?** MSX, the standard system that lets software for one MSX computer run on all other MSX computers, is sweeping the low-end market in Japan. It will account for nearly a quarter of 1984 Japanese computer sales and is supported by close to 20 local manufacturers. Their systems are now available in Europe, and will hit U.S. beaches in early 1985. Stateside, the MSX Interest Group (MIG) is keeping members up to date on latest MSX graphic standards developments, and publishes a monthly newsletter. Annual dues are $15. Write to *MSX Interest Group, Room 1009, 350 Fifth Ave., New York, NY 10011.*

NEW LITERATURE

○ **LAN Glossary.** To obtain a free 24-page booklet, *Glossary of Local Area Networking Terms*, send a written request on your company letterhead to *Director, Corporate Communications, Ungerman-Bass, Inc., 2560 Mission College Blvd., Santa Clara, CA 95050. 408/496-0111.*

○ **Personal computing how-to booklet.** *Procedures and Practices for Personal Computing*, a 29-page booklet prepared by a leading personal computing executive training firm, offers tips on and covers a variety of topics ranging from creating a proper work environment to making a new spreadsheet model. Available in quantities of 25 or more at cost to companies that use personal computers. For information, write to: *Forum/Nevison Executive Computing, 80 Thoreau St., Concord, MA 01742.*

○ **For medics only.** *Currents*, a free newsletter about medical microcomputing systems is available to professionals in cardiology, radiology, internal medicine, and biomedical engineering. To subscribe, write to *Trinity Computing Systems, Inc., Suite 408, 1010 Holcombe Blvd., Houston, TX 77030. 713/790-1894, or 800/231-2445.*

○ **MAI accounting software brochure.** General accounting packages for IBM PC, XT and compatible computers are described in a recently published

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BARON'S MicroComputing REPORTS

GRADING EDUCATIONAL SOFTWARE (PART II)

The two forms of educational software most likely to be useful to adults are *tutorials* and *simulations*. (The third, *drill and practice*, as well as the inherent differences between these three forms were discussed in Part I which appeared last month.) Understanding their nature, potential and limitations will help you make a suitable selection.

Tutorials

Of the three types, a tutorial most conforms to the traditional educational process. Peachtree's *CompuRead*, for example, follows approximately the same coursework, and in the same manner, as the curriculum used in many schools.

A tutorial's main purpose is to teach a

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COMPUTERS THAT HEAR YOU SPEAK (Part I)

Your computer may already talk, babble and sing — even whistle if you really want it to. Now, it can also listen. Within this decade, according to voice input experts, you will be able to routinely speak to your computer and tell it what to do — update a file or run a spreadsheet; have a hot tub waiting, or start the roast in your oven.

Will progress in voice recognition go all the way down the road in the 1980s — to the VAT (voice-activated typewriter) that will type your words as you talk? It's still an open question. Few authorities predict it before the year 2000. But inventor Ray Kurzweil expects to bring out a practical, under-$10,000 VAT with a 10K-word vocabulary next year. Until now, high prices have discouraged widespread development of voice recognition devices. Today, however, the first affordable ($300 or less) products are beginning to enter the market. Initially, the words that your computer can recognize and the way you must say them (separately with pauses in between) are strictly of the "me Tarzan, you Jane" variety. Yet, despite the primitive state of voice recognition today, its future impact promises to rival in importance the substitution of transistors for vacuum tubes in computers back in the 1950s. "Voice is the way that everyone will eventually interface with a computer," states consultant John Chamberlain of Advanced Office Concepts.

The long wait for voice input

Voice recognition has been almost ready since the 1960s when punched cards were still the primary data media.

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COMPUTERS THAT HEAR YOU SPEAK *(continued)*

It was then expected to soon become a standard computer feature (much like voice synthesis is on its way to becoming today). However, even though its principles were well understood, developing voice recognition technology has proven to be far more difficult than anticipated 20 years ago.

The major hurdle has been the exorbitant computation cost of early devices. For example, in the 1970s, a sophisticated experimental system required at least one hour of computer time on a large mainframe to recognize a single second of speech.

The primary factor driving up the cost of voice recognition is linked to its basic input process. To digitize voice information for computer processing, word elements are frequently "sampled" to establish the amplitude of their soundwaves. Typically, a word that can be said in one second is sampled 8,000 times at eight sound levels — equivalent to 64,000 bytes (as against only 80 bytes to store the same word keyboarded in). This requires processors that are very fast, very accurate, and very expensive.

Breaking through the cost barrier

Researchers have focused on hardware improvements to bring down the cost of voice recognition. Intel, Motorola and other manufacturers that "do silicon" have come up with steadily faster microprocessors requiring only I/O circuitry to become complete voice input systems. TI's TMS320 chip, for instance, executes up to 5 million instructions per second.

Voice input devices, primarily boards for Apple II and IBM PC personal computers, now help some users control spreadsheet and voice processing runs. They are also used in "hand-and-eye-busy" situations where entering information through a microphone instead of a keyboard is a paramount advantage. These extend from predictable applications in laboratory and medical settings to such diverse uses as routing passenger luggage for United Airlines, quality control reporting at various aircraft and missile plants, and monitoring entry into security areas.

Yet, voice input devices, this year, still cost over $1,000. For the average PC user, this may seem a lot to pay for a speaker-dependent system with a vocabulary of fewer than 400 words. In fact, one marketing manager readily admits that his market mostly consists of the 10,000 or so engineers working on newer and better voice systems.

Nevertheless, 1984 may well be the watershed year when the voice input cost barrier is finally broken through. System cost reductions ranging from 10% to 30% are widely expected next year. More significantly, new products are starting to enter the market, priced well below $1,000.

Among these new products, Mark II from Dragon Systems, Inc. uses software to perform what, in previous systems, were almost exclusively hardware functions. Enhanced algorithms significantly reduce the number and cost of the computations required for high-level recognition. This speaker-dependent system has been 99.3% accurate on a test of over 5,000 utterances.

Mark II's hardware consists only of a low-cost, 8-bit analog-to-digital converter, 16K ROM, 8K RAM and a TI TMS320 microprocessor. Accordingly, the added cost of producing a computer with the Dragon algorithm is claimed to be under $100. Adding an audio section to an existing PC is less than $50.

Mark II will be incorporated first in the ACT Apricot Portable computer and three Koala Technologies' products. The 16-bit Apricot Portable will have a vocabularly of 4,096 words, 64 recognizable at any one time. Bundled software includes two voice-activated programs and other applications packages that can be programmed to respond to voiced commands. The computer, with 256K RAM expandable to 1 Mbyte, and a 720K disk, costs $3,195 ($2,695 with monochrome screen).

Among the three Koala products ($300 each) is a software and circuit card system for the IBM PC and XT. Using it, you can control productivity software, such as 1-2-3, dBase II, WordStar, etc., with vocal commands. It is claimed to have facilities comparable to those of the $2,600 Speech Command System for the Texas Instruments Professional computer.

The other two Koala systems run on Apple II computers (excluding the IIc). One is an interactive reading program for young children. The other is a programmer tool kit for adding voice control to Apple programs. ●

HOW VOICE RECOGNITION WORKS

Voice recognition is basically a comparison process. Spoken words, entered through a microphone as analog signals, are broken down into components. The components are filtered to eliminate "noise" and digitized by a *recognizer*. They are then matched against vocabularies of digital patterns of specific words already stored in computer memory.

The usual process for converting spoken words into digitized information from these signals is *time-domain synthesis*. With this method, waveforms that represent the intensity of sounds are "sampled" (or measured) approximately 8,000 times per second.

Another method, *LCP (linear-predictive coding)*, involves far less sampling — only about 100 times per second. Instead, speech elements are estimated using mathematical coefficients stored on ROM chips. LCP-based voice recognition is of mediocre quality but it is far less expensive. Accordingly, LCP ROM chips are being incorporated into toys, home appliances and automobiles.

There are two distinct types of speech recognition systems:

• *Speaker-dependent* systems only recognize the voice of a speaker who has repeated the system's vocabulary into the computer. These systems can frequently store several speech patterns, each on a separate template to recognize the voice of more than one speaker, one at a time.

• *Speaker-independent* systems are designed to understand all speakers without having to first hear them. Instead of one template for each speaker, they rely on manufacturer-developed "representative" patterns based on large numbers of voice samples.

Either system is at least 90% accurate in recognizing words. However, speaker-dependent systems can score higher because they are attuned to the voice of a specific speaker, not just representative speech patterns. Recognizing larger vocabularies is easier for them, too.

There are also two main speech formats in word recognition:

• *Utterance speech* limits the speaker to single words or brief phrases with a pause between each. This is the type of speech recognition now in use.

• *Continuous speech* permits a normal style of talking. Speakers can talk naturally for as long as they wish without stopping between words. This is the format that would be required for dictating non-stop to a word processor.

Baron's MicroComputing Reports (ISSN 0746-598X) is published 12 times a year, monthly, by Computer Information Resources, at 344 East 49th Street, New York, NY 10017. $39.95/yr. (Canadian and foreign, add $5.00.) Second class postage paid at New York, N.Y. and at additional mailing offices. *POSTMASTER: Send address changes to Baron's MicroComputing Reports, P.O. Box 305, Dover, NJ 07801.*

EDUCATIONAL SOFTWARE *(continued)*

subject about which the student has little or no knowledge. But an ideal program does not just prescribe a course of study; it also alters the course according to the student's success or failure in mastering the information at any point. This implies that a program should frequently test the student's knowledge and check the results against pretest answers. Most, if not all the programs in the Science of Learning series by Eduware provide such features.

Tutorials handle some subjects better than others because of the way computers process data. Those that teach programming or mathematics are generally the most successful. Also quite effective are tutorials on subjects with clearly defined and precise rules such as any of the physical sciences. Where there are many exceptions to the rules — such as English grammar with its irregular constructions — tutorials are forced to narrow their scope to only that information that obeys the rules. If there are tutorials for the humanities or social sciences, they are probably too vague to be of any real use.

One of the best-rated tutorials available is Peachtree's *Back to Basics Accounting Program*. (In the heavily promoted software field, a product does occasionally give more than it promises.) It not only provides the necessary information for operating the accounting package, but it also teaches you the basic accounting principles clearly and comprehensively.

Note: Beware of claims that a tutorial is interesting. Interest is what you bring to it. Remember, the goal of a good tutorial is to teach, not entertain.

Grading Tutorials

• **Pretesting.** If a tutorial does not contain a pretest, you have no way of establishing the level of your abilities and of your starting knowledge. Also, the absence of pretests implies that other features may also be lacking, such as ability to assign you to an easier or more difficult level.

• **Reassignment.** The better programs can move you to a higher, more demanding level based upon the work completed. This means you can progress at your own pace.

• **Explanations.** A tutorial should include explanations and examples of what is being taught. Otherwise, it is more of a drill-and-practice program.

• **Readings.** A good tutorial makes additional material available. This can be non-program documentation included with the package or a suggested list of readings.

Simulations

Simulations, in contrast to tutorials, use entertainment as part of their methodology. By presenting a subject in a game format, they teach through examples. These educational programs are "swim or sink" — you learn as you go. For instance, users of PDI's *Clipper: Around the Horn in 1850* quickly realize they need to know navigation if they don't want to crash against an iceberg or be stranded on a shoal. Although many simulations tend to sacrifice accuracy for entertainment, the ideal simulation is nearly indistinguishable from a real event.

The best programs contain enough documentation so that if you are curious, you can check facts and theories. Some have even expanded the knowledge of experts in the field. For example, during the beta testing of Activision's *Space Shuttle* for the Atari 2600, the wrong jets were fired on re-entry. Still, a successful landing was managed. The designer called NASA, one source of help in creating this simulation, to inform them about the suspected bug. They found it on the actual shuttle, too.

Simulations work well for virtually any subject. They are only limited by the ability of the designer. Since no test or exercises are given, you have no gauge against which to measure your progress. But you do get a good sense of the "feel" of a subject.

Grading Simulations

• **Verisimilitude.** The closer the simulation is to reality, the better it functions as a teaching tool. For example, a business-oriented simulation should incorporate real-life problems and solutions, even if the overall context is one of fantasy. Take *Run for the Money* by Scarborough Systems. Although set on a far-off planet, it includes product manufacture and marketing in the course of the game. The fantasy element exists side by side with concepts like the effect of advertising on sales and the use of business projections for planning and growth.

• **Accuracy.** Simulations based upon inaccurate facts or outmoded theories are of questionable educational value. A space exploration game that combines science fiction with science fact, such as Atari's recently announced *Through the Starbridge*, probably trades off accuracy for entertainment.

• **Flexibility.** Just as in real life, there is more than one way to resolve a conflict, find the answer or solve a problem, simulations should allow you to explore alternatives. In Electronic Arts' *Seven Cities of Gold*, the New World explorer can deal with the native inhabitants in a variety of ways. He can trade with them, convert them or conquer them.

• **Re-usability.** If the program is a true simulation, each decision you make will effect the course of events that follow. Therefore, the game can take many different paths. It will be interesting enough to play again and again, and it will have more learning value.

• **Interest.** Simulations should be entertaining as well as educational. Their greatest strength is in keeping you interested. The more exciting they are, the more frequently they will be used. ●

Non-Educational Educational Programs

Many programs not generally considered to be educational, actually are. Programming languages and word processors are perhaps the best examples. They both offer an open environment in which you can explore, make mistakes and learn.

Logo-based turtle graphic languages, such as Carousel's *Telly Turtle*, are especially adept at teaching not only programming but logical thinking. A word processing program such as the *Bank Street Writer*, written by educators for teaching purposes, can help you learn to organize your ideas and ultimately think more clearly.

DATA BRIEFS... *(continued)*

MAI/Basic Four brochure. Descriptions cover 10 packages (General Ledger, Accounts Payable, Accounts Receivable, Inventory, Purchase Orders, Order Entry, Payroll, Sales Analysis, Financial Statements, and Fixed Assets), which can stand alone or be integrated modularly. Also covered is Report Writer, which generates reports based on accounting data. For a copy of the brochure, contact *Marketing Communication Dept., MAI/Basic Four Business Products Corp., 601 San Pedro N.E., Albuquerque, NM 87108.*

○ **Down on the Farm.** A newsletter produced by the Rural Computer Users Society (RUCUS) focuses on helping farmers and ranchers to better use their computers for business. Subscribers can also use it to ask high-tech vendors questions about their products. Write to *RUCUS, POB 233, Hamilton, VA 22068.*

BULLETIN BOARDS SYSTEMS

○ **Arts and technology.** A bulletin

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Between PCs: The Null Modem

Whenever two or more computers are used for a common purpose, the problem of transferring data from one to the other arises. If the computers are compatible, you simply swap disks. However, if they are not — for example, if one is a lap computer — you must transfer the data electronically.

When computers are located far apart, you must use a modem to make the transfer. (See July and August, 1984 issues of *BMR*.) If one of the computers can be brought into close proximity with the other, you can use direct, computer-to-computer transfer. In either case, the procedures are approximately the same. The only difference is that for direct transfer, you would use a null modem.

A null modem is a cable that interconnects the ports of two computers or other devices. Unlike a modem, it does not require data to be *mo*dulated and then *demo*dulated in order to transfer it because the data does not travel across telephone lines. Rather, it is sent directly from the transmitting to the receiving computer.

There are four distinct advantages to the direct transfer method:

- The baud rate, or transfer speed, is not restricted to 300 or 1200 cps. It can be as high as both machines allow, which is usually 9600 baud. You get almost immediate transmission.
- The possibility of transmission errors is very slight. Since there are no incoming phone calls to confuse the software, nor the degradation that can occur while traveling along the lines, you can choose no parity checking without worry.
- You can see whether the transmission was successfully received because the data is immediately transmitted and can be placed on screen at once.
- Transmission via a null modem saves you money because there are no telephone charges.

As with all cables, a null modem matches one computer's port pins to the other's. For instance, the pin that sends the data on the transmitting computer is properly matched with the receiving pin on the other.

Except for rare instances when a ready-made cable will match up with both computers, you will need to have a cable custom-made. However, if you are using several different machines, supplying a cable for each coupling would be too expensive. It would also be inconvenient. (You don't want to end up swapping cables as well as disks.) In that case, a single cable, such as the *SmartCable*, with built-in intelligence to accommodate the peculiarities of different computers will serve you better *(see box)*.

In addition to the proper cable, you need telecommunications software for both computers that permits files to be up and downloaded and stored on a disk. It will enable you to specify the baud rate, the stop bits, the word length, the handshaking procedure, and other necessary protocols so that the computers can communicate with each other. You also need to specify whether you are sending or adding linefeeds and carriage returns. A wrong setting — a duplicated linefeed can cause the text to be echoed on the screen, or a nonexisting one can cause a displayed line to overwrite itself — won't be more than an inconvenience, but it is easier to correct the settings beforehand. For example, to edit out unwanted carriage returns, you would use a word processor or text editor.

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HANDS ON...

• Andrew Tobia$ Managing Your Money. *Meca, 285 Riverside Avenue, Westport, CT 06880. 203/222-9087. For IBM, Apple, soon for Commodore 64 and Atari. $199.95. (Reviewed on an STM PC.)*

This integrated, three-disk financial package manages everything from your budget to your net worth. Along the way, it allows you to plan for your taxes and retirement, evaluate your family's insurance needs, and track your portfolio. Managing Your Money, or MYM as it will be called here, includes other nice little features, such as a memo pad with tickler, a financial calculator (accessible anywhere in the program), and an on-line clock at the upper right hand corner of the screen.

The package is divided into seven main programs, called chapters: Reminder Pad, Budget and Checkbook, Income Tax Estimator, Insurance Planning, Financial Calculator, Portfolio Manager, and Your Net Worth. There is also an index and an on-line, introductory help document. Good as all of this sounds, MYM does have one drawback — its documentation.

Even though the majority of the information needed to run the program is located in the various help screens scattered throughout the package, the same information gathered in a manual would have been nicer. As it is, the user has to jump from one "chapter" to another in order to find needed information. This lack of centralization makes the program difficult to use well.

The program assumes that you have some knowledge of finances. If you are a beginner at setting financial records in order you will find certain prompts and data fields difficult to respond to and the help screens of little guidance.

In spite of these shortcomings, MYM is an excellent package. Data can be transferred from one program to another. Hypothetical situations can be explored. And bar and pie graphs are automatically constructed from various data, such as income and expenditures.

Many of the function keys used in one program produce the same effect in the others. For example, F-9 invariably brings you back to the preceding screen and F-10 returns you to the mini menu. Although the error trapping is very good on the whole, when you do make a mistake entering data, it may be easier to return to a previous screen and start from scratch than try and correct a figure that has already been entered.

Since most of the programs operate similarly, a close look at the Financial Calculator will give you a feel for the whole package.

The first screen of the Financial Calculator enables you to calculate compound interest, loans and annuities, interest rate vs. yield, and current yield vs. yield to maturity. In the case of calculating compound interest, the program requires you to complete four of the five data fields supplied: starting amount, interest rate, amount and frequency of additional deposits, years on deposit, and end balance. The calculation is performed by hitting the F-1 function key. The Financial Calculator also permits retirement planning, investment analysis, and it has the ability to track loans.

As with the other programs, help screens are available by hitting the ESCape key. Some of the help is related to the operational procedures; financial advice is also occasionally provided. For example, some of the differences between Keogh and IRA plans are shown. In planning retirement, the program points out the necessity of consid-

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SECOND COMPUTERS

• **In search of the ideal portable?** These, according to STM president Lisa Williams, are the specs of what she envisions as the "world's ideal portable." It must, she says, have these 10 features — *weight:* 2 lbs.; *display:* 24 x 80 columns, 8.23 inches diagonal; *dimensions:* 9.5 x 6.0 x 0.5 inches; *keyboard:* fullsize collapsible keyboard with keypad; *power:* optional battery, 8-hr. minimum, one-month full power to memory; *communications:* built-in 9600 baud modem; communicate with TTY 3101, 2780/3780, 327 x bysynch/SDLC, cellular radio, teletex; *interfaces:* RS232, IEEE 488, parallel; *supports:* voice I/O; *storage:* standard disk: *price:* $995. No manufacturer, says Williams, can deliver all of these features today. But she adds that, in view of the stepped up rate of technological progress, "we will be able to do it within 24 to 36 months."

• **Memory** is a key technological area that might have featured prominently on Williams' list of yet-to-be-attained features less than 12 months ago. However, progress has been particularly rapid in this field. A report prepared by Montgomery Securities for Intel Corp. foresees that by 1988, 1 megabyte of dynamic RAM will require only 32 256K chips and will cost about $200.

• **Flat-screen displays,** however, are one of the more trouble-prone elements on Williams' list. Liquid crystal displays (LCDs) are still relatively expensive — about $340 (to manufacturers) for 25-line x 80 devices. Prices are expected to decline — to under $200 by mid-1985 — but their legibility will still suffer from poor contrast between characters and backgrounds, and lack of backlighting (a prohibitive power drain for battery-powered systems). Newer, higher-legibility technologies are more expensive — about $700 for electroluminescent screens and just under $1,500 for plasma displays. They also have high power requirements.

• **Model 100 portable disk drive price cut.** The price of the recently introduced PCSG/Percom Data Portable Disk Drive has been reduced from $799 to $599. The drive, which saves up to 400K of data on a 3.5-inch disk, weighs less than 3 pounds. Its dimensions are 2 x 4.25 x 8.25 inches. *Portable Computer Support Group, 11035 Harry Hines, #207, Dallas, TX 75229. 214/351-0564.*

• **SORD IS-11** ($995) is a Japanese-made lap computer distinguished by its integrated, built-in applications programs. The availability of this integrated group of five programs gives the Sord a major edge over other 40-column display lap computers.

Hardware

The Sord IS-11 comes with an 40-character by 8-line LCD, 64K of ROM, 32K of RAM (expandable to 64K), a 70-key keyboard with some of the keys doubling as a numeric keypad, a ROM cartridge, and a micro-cassette recorder for mass storage. It also includes Centronics-compatible parallel and RS-232C serial interfaces; bar code reader, serial I/C modular jack, and parallel I/O expansion ports; and a battery charger/AC adapter connector. An IS-11B version ($1095) includes a built-in modem.

Optional hardware consists of a separate keypad with function keys ($119) and a thermal printer ($169). Under development are a 3½-inch floppy disk drive and a CRT monitor. The 32K expansion chip costs $239.

Software

The operating system permits program access through a menu-driven front end or at the command level. The menus are relatively fast and provide a number of conveniences for the novice such as help screens and non-cryptic prompts. However, once you are accustomed to the system, the command level (accessible by entering any keystroke other than the carriage return) is preferable. For one thing, it allows you to string as many commands as can fit on the reserved two-line area. (This area effectively cuts the LCD file display area down to six lines; however, it is only a problem in the I-PIPS mode.) This means that you can create a batch file of sorts. The stringing together of commands can be started at any point in the menus or at the prompt. At the command level, it is also possible to get a menu of commands by typing in only the first letter of a command.

The five integrated programs are: *I-PIPS*, a spreadsheet program; *I-EDIT*, a simple text editor; *I-CALC*, a calculator; *I-COMM*, a telecommunications package; and *I-WP*, a word processing package. I-WP is on a ROM cartridge; the others are built in. Although each of the programs have their faults — for example, I-WP is capable of searching for, but not replacing, text — together they work beautifully.

The *I-PIPS* program is the backbone of the integrated system. Through its menu, you can ask for a directory, establish a window, sort and edit data, save and load files to tape or memory, perform calculations, print data, and create graphs. Most of these features can be used also on files created by the other programs.

The built-in text editor, *I-EDIT*, permits the composition of simple documents. All editing is done with the cursor keys and the Delete key. The program does allow the insertion of I-PIPS tables within the document. With the I-WP program, you can also copy, move and delete blocks to text, search for words or phrases, display the number of the line the cursor is on, and justify text.

The IS-11 also comes with a micro-cassette that contains *Desk Organizer*, a set of applications for the executive, and a number of utilities. Within the Desk Organizer, you can schedule appointments, log in expenses and tasks, and maintain a telephone directory. The utilities provide additional commands, the ability to transfer data, and a calendar. Two ROM cartridges are to be made available: *I-TRANS* ($100), a utility that permits the transferring of data in a format compatible with PC/MS-DOS; and a *Basic* language cartridge.

There are three manuals for the IS-11: a user's guide, a tutorial and a software guide. Each of them is generally clearly written and adequately illustrated. Although the tutorial has you creating spreadsheets immediately and handles the text programs well, it does not deal with I-COMM, the telecommunications software. The software guide, which reads like a combination DOS manual and advanced user tutorial, makes up for the omission.

There is little doubt that the SORD IS-11 is an excellent lap computer. Although its price (slashed by one-third by some discounters) may seem high at first glance, remember that the software comes with it. *SORD Computer of America, Inc., 645 Fifth Avenue, New York, NY 10022. 212/759-0140.* ●

DATA BRIEFS...*(continued)*

board system has been established by the Center for Advanced Studies in Art and Technology (CASAT). It enables artists and scientists to exchange views and data on the uses of technology in the arts in such projects as sound synthesis and image processing. Apple high-resolution images can be up- or down-loaded to the system. To reach the CASAT BBS, dial up *312/443-3744*.

• **On-Line Computer Telephone Directory (OLCTD)** lists over 600 BBSs. OLCTD also answers questions concerning communications software, protocols, modems and other "modemizing mysteries." Access is 24 hrs./day via either 300 or 1200-baud modems. *913/649-1207*.

• **BBS Directory** lists in print over 700 systems by state, area code, and computer model. Free program downloading, computers supported and system specialization are indicated for each BBS. The directory is published quarterly and is available for $5.95 from *BBS Directory, P.O. Box 4150, Beach Station, Vero Beach, FL 32964. 305/466-5515.*

• **BBS Log Book** is, literally, a personal address book for users of bulletin board systems. In addition to providing space for a personal directory, the book also contains sections for recording long distance calls, and BBS access numbers, passwords, times on and off, and other reference information. Available for $5.95, plus $2.00 for shipping and handling, from *Bobby Ballard Atmospheres-BBS Log Book 1207 Eighth Ave., Brooklyn, NY 11215.*

NETWORK SERVICE

○ **ITT Dialcom, Inc.** ABI/INFORM has been added to the Dialcom database service. ABI/INFORM is a product of Data Courier, Inc., a subsidiary of the Courier-Journal and Louisville Times Co. A business database, it contains 200-word summaries of articles in over 650 U.S. and foreign publications. Any of them can be retrieved via key words. Full texts can be ordered via Dialcom's electronic mail system. Access charges are $28.50 per hour plus the standard Dialcom connect rate — $16.50 per hour weekdays, $12.50 weekends and off-peak hours. *ITT Dialcom, Inc., 1109 Spring St., Silver Spring, MD 20910. 301/588-1572.*

○ **NewsNet.** The ISIS (Internationally Syndicated Information Services) New Electronic Media Newswire is now published semimonthly on NewsNet. The service features trade magazines, newsletters and press releases organized under interest headings and accompanied by commentaries. *NewsNet, 945 Haverford Road, Bryn Mawr, PA 19010. 215/527-8030.* ●

PC Money Talk

FINANCIAL PRODUCTS AND SERVICES

• **CompuServe commodity reports.** Three commodities information products have been added to the Executive Information Service of the CompuServe network. *News-a-Tron*, a daily report published by Herman Communications Corp., features news, analytical information and quotes. *Futures Focus* is a weekly newspaper published by Agri-Commodities, Inc. It includes trade recommendations, trading news and long-term assessments, and a review of technical indicators. *Investors' Forum* is a special interest group which provides opportunities for members to exchange questions and opinions.

• **Newsnet Investment Database Additions.** Two specialized newsletters, *Wall Street S.O.S.*, a daily stock analysis and forecasting service, and *The InvesTech Newsletter*, a biweekly review of technology investment environments, are now available exclusively in electronic format on the NewsNet database service. Also newly available on NewsNet are *APS Review*, a weekly newsletter on petroleum economics published by Arab Press Services, and *Futures Focus*, a weekly review of commodities markets. *NewsNet, 945 Haverford Rd., Bryn Mawr, PA 19010. 215/527-8030.*

BUYING SMART

• **You can keep your old dBase II, or WordStar or 1-2-3,** says Innovative Software. Users of the three packages can move up to Innovative's three SMART programs which work independently or together as a common system — *Spreadsheet with Graphics, Data Manager* and *Word Processor* — for $195 per package, or all three for $395. (The entire SMART system lists for $895.) Innovative only requires owners to provide proof of ownership and the registration number of the integrated systems. Lotus allows 1-2-3 owners to trade up to the new Symphony system, but they must turn back their software. Innovative also claims that the SMART programs, which can be linked in a common windowing environment, outperform both Symphony and Ashton-Tate's Framework — and also has lower memory requirements (256K) than Symphony (320K) or Framework (384K). *Innovative Software, Inc., 9300 W. 110th St., Suite 380, Overland Park, KS 66210. 913/383-1089.*

• **Why buy when you can rent?** Do you want to have the use of the latest IBM and Apple recreational and educational software, complete with documentation, without paying high publishers' prices? An alternative, according to The Soft Source-R, is to rent them. A one-time, $29.95 membership fee entitles you to rent any number of packages for 30 days. If you do want to buy any of these titles, rental fees count toward your purchase. Members receive periodic lists of available software. *The Soft Source-R, P.O. Box 2931, Joliet, IL 60434.* ●

FREEWARE

• **Atari puhlic domain programs** from GFXBBS bulletin board include *BASIC* — games and graphic demos (2 disks); *Communications* — terminal programs; *Action!* — programs in Action! programming language; *Amateur Radio* — for ham operators; *Utilities; Disk Utilities*. Also available are two double-sided diskettes (not downloadable from GFXBBS) — AMIS BBS has files and documentation with which to start your own BBS; Disklink is a smart terminal program for 835 and 1030 modems. Media and handling charge is $10 per diskette (no CODs). Also program diskettes can be swapped particularly for ham radio software and Action! routines. *The GRAFex Company, 1112 Arlington Lane, P.O. Box 700058, San Jose, CA 95170. Voice: 408/996-2689. Modem: 408/253-5216.*

• **PC-Write** is a widely used word processing program for IBM PCs and compatibles (and, with keyboard changes, for Rana's Apple II system). It is described as suitable for novices, but also offers advanced features for professional writers such as simultaneous split screen editing of different files. The program is now available in version 2.2. Program diskette is available for a $10 handling fee, or a free copy can be obtained from an acquaintance. Registration is $75 and includes a free manual (otherwise $25 for single copy) copy of next major version and telephone support, Pascal and assembly source diskette, and $25 commission when someone else registers from a copy of your registered diskette. *Quicksoft, 219 First N #224, Seattle, WA 98109. 206/282-0452.*

The Null Modem

After the actual connections are completed and the telecommunications programs in both systems are up, you must set one computer for transmitting and the other for receiving. For both, a filename must be designated but it does not have to be identical for each of the two connected computers. You will usually need to open a buffer on the receiving end prior to transmission and close it afterwards. The successfully transferred data should then be copied or pipped over to the appropriate user area or file directory.

Remember, there are no mysteries to direct data transfer. It really is simple — if you have the proper cable and software. ●

• **SmartCable.** *IQ Technologies, 11811 N.E. First Street, Bellevue, WA 98005. 201/451-0231. $84.95.*

By providing a hassle-free connection for RS-232 devices such as computers, modems, printers and plotters, the SmartCable solves interface compatibility problems. It consists of a fist-sized processor unit with five lights (two yellow, two green and a red), two switches and two ports, and a ribbon cable with male and female 25-pin plugs on one end and a special 26-pin plug on the other.

All you have to do is set the two computers or other devices so they have the same variables, such as 9600 baud rate and no parity checking. You no longer have to worry about whether the pin configurations are compatible. The SmartCable does it for you. If the configurations are the same, the SmartCable acts as a null modem. If not, it makes the necessary adjustments to establish de facto compatibility.

To use the SmartCable, connect the special 26-pin plug to one computer and the male or female plug to the other unit. Then throw the bottom switch and check the top of the unit to see whether the two yellow lights are on. If they are, the connection is successful. If one of the green lights is also on, throw the bottom switch toward it. If you see that both green lights or the red diagnostic light is on, you know that you have not yet achieved compatibility for transmission.

The short but adequate manual explains the steps to take. Essentially, though, that's all there is — plug SmartCable in and throw a switch! This is how computing was meant to be.

INSIDE INFO

▸ How can I create a macro for my word processing software?

Short of programming the function keys (a very involved task), the easiest method to "macromize" your word processor is through the search and replace function. The only drawback is that each macro (a function which substitutes a one-to-three keystroke sequence for a word or phrase) must be defined separately.

Wherever you have a word or phrase which could use the help of a macro, you simply type in a series of characters that would not be recognized as a viable word. For example, you can use a double ampersand (*&&*) or even an ampersand combined with a number (*&1* and *&2*) so that you know immediately which macro you are using. Then, by searching for and replacing each occurrence, you can have a pseudo-macro.

▸ Because of the limits imposed on filenames, I will have to keep a log of all the programs and documents in my library. How can I best do it?

First, organize your programs and text files so that application programs are separate from utilities, personal text files from spreadsheet files, etc. Then, if your DOS permits a volume name, use it; if not, create an empty file whose name could be interpreted as the volume name.

In either case, redirect the output of a directory listing to either the diskette in question or a blank one. (If the directory is output to the working diskette, you can save it in the file you use for a volume name.)

Then, with your word processor, you can insert a short explanation or definition of each file. You can also organize the files in outline fashion, if you wish, to provide better readability.

Because you now have notes on each file, you can rename your rarely used files according to some sort of code. You can also use the word processor's search function to find any given file.

▸ Why cannot all printers put graphics and text on the same line?

Although both graphics and text are "drawn" on the paper with a pattern of dots, they are treated differently. Since the same patterns are constantly being used for text characters, they are coded in order to speed the printing process. Graphic images, on the other hand, have unique patterns, so they cannot be precoded.

To add to the problem, some printers force a linefeed after each line of data, and because graphics and text are transmitted differently, they are considered to be different. This effectively prevents the printer from processing the second type of data, whether it be graphics or text, on the same line. Those printers which allow the printing of both on the same line do not force the linefeed. ●

TOOLS AND CONCEPTS

PERSONAL COMPUTERS

• **Vocal command computer.** The new ACT Apricot Portable is claimed to be the first computer with built-in voice recognition capabilities. The 13-pound 16-bit unit has a vocabulary of 4,096 words, available 64 words at a time. Its features include an infrared keyboard and optional infrared mouse/tracker ball; color electronics; a full-sized 25-line x 80-column flat panel display; 256K RAM, expandable to 1 MB; and a 720K 3.5-inch disk.

The Portable comes bundled with MS-DOS (concurrent DOS is available as an option), an icon-based command menu interface with multiple windows, SuperCalc, SuperPlanner, and SuperWriter, and two proprietary programs, ACT-DIARY and ACT-SKETCH. Any of these applications packages can be programmed to respond to voice commands. A set of software tools enables users to create up to 16 voice "function keys."

The price of the basic 256K portable is $3,195 ($2,695 without color electronics). An optional 10 Mbyte hard disk is $2,095. *ACT Computers (North America) Inc., 3375 Scott Blvd., Santa Clara, CA 95051. 408/727-8090.*

• **IBM PC-compatible computers in a wide variety of foreign language versions** have been introduced by Applied Digital Data Systems (ADDS), an NCR subsidiary. The ADDS-PC/I ($2,650) comes with an 8088 central processor, 256K RAM, dual drive 360K floppy disks and a 12-inch monochrome display. The ADDS-PC/II ($4,200) features a 10 Mbyte hard disk drive. Keyboard-based foreign language versions provide system status, diagnostic and error messages in French, German, Italian, Spanish, Swedish-Finnish, and British English. Over 100 system and business applications software packages have been introduced with the ADDS systems. *Applied Digital Data Systems, 100 Marcus Blvd., Hauppage, NY 11788. 516/231-5400.*

(continued on page 8)

Words Processed

• **A Buyer's Guide to Microcomputer Business Software: Accounting and Spreadsheets.** *By Amanda C. Hixson. 320 pages. Addison-Wesley. $19.95, paper.* This guide addresses the question of which accounting and spreadsheet programs to purchase. Unlike most guides, it does more than list the features in the programs discussed; A Buyer's Guide also reviews the products, stating not only the program's positive aspects, but also those which may cause trouble sooner or later.

The guide's introduction discusses the necessary steps to be taken prior to purchasing a system and even supplies a checklist for estimating accounting needs. The accounting packages discussed are: *Accounting Plus, The Champion, CYMA, Peachtree, Solomon Series Software*, and *Structured Series Group;* the spreadsheets under consideration are: *Lotus 1-2-3, Multiplan, SuperCalc2, PerfectCalc, Target Financial Modeling*, and *VisiCalc Advanced Version*. Although there are "report cards" for each of the programs, they come after the specific review of the program. This means that a reader who already owns one of these systems is forced to read some of the non-compatible reviews. The guide could have also used more screen shots. Aside from these minor drawbacks, Hixson's attempt at guiding potential users is quite successful.

• **The Computer Phone Book.** *By Mike Cane. 436 pages. New American Library. $9.95, paper.* This directory compares itself to the Yellow Pages. It is more than that and yet, it has the same disadvantages. The majority of the book consists of listings of on-line systems, data bases and bulletin boards. They are divided by region — local, national, Canadian and overseas. Each listing includes the necessary protocol, baud rate, cost (if any), contents, features and comments. The comments range from, "This is another fine Color-80 system. It is worth a long-distance call" to "This system would be of interest only to local callers." The first 137 pages are an overview of telecommunications and how to go about getting on-line. A number of appendices are included, from bulletin-board system help files to a sampling of communications software suppliers.

The problem with a book of this type is that it is generic; that is, its only purpose is to list boards for all systems. Thus, it does not supply information about getting on-line with a specific computer. As a result, usefulness is limited to the listings and, as we all know, many listings no longer exist by the time the book sees print (as the author admits). So, if you need bulletin board listings, the book is worth the price; if you are already on-line, you probably can do without it.

• **The Computer Cookbook 1984/1985 Edition.** *By William Bates. 392 pages. Doubleday. $14.95, paper.* A book that most anyone (computerist or not) would do well to own, the Cookbook is an encyclopedia of computer-related information. Beginning with accounting, it takes you through fifth generation, gambling, parallel ports, Smalltalk, video discs, and ends with xerox. Although none of the topics are covered well enough for a hardcore hacker, they are informative, clearly written and ultimately, interesting. Even if you, personally, have no use for such a book, it will make a great gift for anyone who enjoys reading about computers.

• **Small Time Operator.** *By Bernard Kamoroff and Emil Krause. 144 pages plus worksheets, template formulas and tables. and Books, 702 South Michigan, South Bend, IN 46618. $19.95, spiral-bound paper.* Although its stated purpose (to help you set up a business and keep the records) is not unusual, the book itself is. It is actually two in one — a general text (white pages) and computer-related information (yellow pages); the text can be read independently of the other. In addition, the book is liberally seeded with quotes from almost everyone imaginable, including Bilbo Baggins and Scrooge.

The contents cover such topics as: setting up a business, bookkeeping, taxes, depreciation, and ledgers. The spreadsheet formulas include cashflow analysis, net worth, invoice, payroll ledger and quarterly payroll tax reports.

tools & concepts- *(continued)*

• **Framework telecommunications capabilities.** Ashton-Tate has expanded telecommunications capabilities of the Framework integrated package to permit communications with outside sources and bulletin boards. Framework integrates word processing, spreadsheets database management and graphics software capabilities. Ashton-Tate recommends a minimum memory requirement of 384K, up from 256K to use Framework with telecommunications.

• **Trajectories** is a statistical processing system that includes over 40 separate programs. Developed by statisticians it is menu-driven and is available in basic source code. Trajectories is priced at $395 and runs on any CP/M, MS-DOS, or PC-DOS system with a minimum of 64K memory. *DBi Software Products, One Energy Pl. 5805 E. Pickard Rd., Mt. Pleasant, MI 48858. 517/772-5055.*

• **Patents filing software.** *"Program 101"* generates trademark and design patent forms for filing with the U.S. Patent and Trademark Offices. It will also fill out standard copyright forms for filing with the U.S. Register of Copyrights. The program is claimed to be the first of its type offered to the public. "Program 101" runs on IBM PC and TRS-80 Model III-4 computers. It may be ordered in separate Design Patent, Trademark or Copyright versions for $49.95 each. All three are available for $99.95.

HANDS ON *(continued)*

ering inflation and tax laws. (The package works with the 1983 Federal Income Tax Law, and allows updating on various screens). Another help screen provides information on effective annual yield, compound interest, loans and annuities, bond yields and interest rate vs. yield.

Managing Your Money may not be better than a personal financial consultant, but it does allow you to keep track of the person you hire.

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PERSONALIZED REPORT FOR: TRS-80

October, 1984 Alan B. Abrahamson, Technical Editor

* LIST/KEY

The promotional literature touts List/Key as a data base management system and uses a chart to compare it to Pfs:FILE and dBASE II. But this information is misleading because it implies functions which do not exist. List/Key is more of a file manager than a true DBMS. To compare its abilities with the flexibility and power of dBASE II is not only absurd, but sells the program short. However, if you have the need to manipulate a mailing list or some other form of simple data, then List/Key is worth looking into -- even at its $250 price tag. The package runs on the Model III, 4 and 4P computers and requires only one disk drive.

Terming List/Key "user friendly" is an understatement. This overused buzzword has almost lost all meaning. But List/Key is one of the few programs that really does shine in its ability to interface with the user. The software contains all you need to know in an easily accessible form. You do not become bogged down looking through manuals and instructional materials. For example, help messages (which appear on the last line of the display) can be called on any screen simply by pressing the [Shift] [?] keys. Although not a new convention, its implementation as done by List/Key is terrific. A complete 160-page, tablet-style, 5-1/2-inch-square manual is supplied with the system; but you will probably refer to it only for the most complex functions.

List/Key is written primarily in Basic plus some machine language. It operates efficiently and with reasonable speed, although there is a lot of disk I/O during program execution due to the file access methods that it uses. It accesses all active drives in your TRS-80 system and spans data disks. Sorting and searching seem fast, but I did not have thousands of records in my data base. A function called MultiLog allows the creation of multiple indexes for searching and selecting records by whatever criteria you establish. All the standard editing and entry features exist. Because there is no keyboard buffer (which would allow you to type ahead of the program), fast typists should watch their input screens carefully, especially before saving the data to disk.

Among noteworthy provisions, the field "ditto" allows a field to be filled by depressing a single key. Also, up to three labels can be printed across the page. There are full record list and telephone directory (short form) list formats. Multiple and return address labels as well as extended size specialty labels are formatted in the system. Envelopes can be printed with or without a return address. According to the manufacturer, record capacities are:

Disk Drives	One	Two	Three	Four
Small Format	900	2,500	5,000	5,000
Medium Format	400	1,200	2,400	3,500
Large Format	250	700	1,500	2,000

Most business programs are of the "plain vanilla" variety. List/Key, however, has well-organized and attractive screens. It uses the TRS-80 Model III's graphics character set where appropriate and, of all the programs I have ever reviewed, it is one of the few that makes good use of the special characters and graphics that are built into the computer.

Another unique feature involves error recovery. The program generates error reports with the standard Disk Basic and DOS error codes. Reports can be sent to

(Continued on page 10)

to the manufacturer so that its programmers can solve your problem or give you reasonable suggestions. I found the service to be outstanding; the staff was cooperative in helping me. I get the impression that the manufacturer wants to support its product in a very business-like manner.

If you own one of the demo versions ($25), it can be "unlocked" by making a simple phone call. Essentially, a specially coded access password is typed into the system, and when the numbers are verified, the disk is brought up to full operational mode. Although most of the features are available, the demo version does not permit the recording of data. Once the install password is verified, you will be allowed to select from several formats for field sizes, AB formats, printer options, etc. (Unfortunately, List/Key does not permit fields to be created once the data base is set up, but it does allow you to change the name of the fields.)

Several options are in the works. They include: Form/Key, which creates custom reports and form letters; Stat/Key, for compiling mathematical summary reports; and Comm/Key, which allows the transfer of data from one computer to another with an auto-dialing feature. Each of these optional extras will be priced at $50 each. The Soft Place, 1439 East Garfield Avenue, Glendale, CA 91205. 818/243-5111.

* DOSPLUS IV/A

This disk operating system is designed to provide a faster, more powerful alternative to TRSDOS for Model 4 users. DOSPLUS IV/A includes an enhanced BASIC interpreter and M-ZAL, a disk editor/macro-assembler. A MEDIC (Menu Environment DOS Interface Controller) system utility provides single keystroke access to frequently used file operations. Among other system utilities are: diskzap for viewing and editing program or data files; diskdump which combinas a file-editing program with address and byte locating ability; dircheck for disk directory verification; filedisk which supports directory space usage and memdisk which assigns a portion of memory for use as virtual disk drive.

DOSPLUS IV/A is $169.95. M-ZAL, available separately, is $149. Registered owners of the earlier DOSPLUS IV system can upgrade for $25. Micro-Systems Software, Inc., 4301-18 Oak Circle, Boca Raton, FL 33431. 305/391-5077.

* ARRANGER II, VERSION 2.1

The Arranger II ($49.95) is an automatic disk index system capable of cataloging up to 255 disks or 11,000 filenames. It comes with its own operating disk for Models I, III, 4 or LNW, and can read and write to NEWDOS, LDOS, DOSPLUS, TRSDOS, ULTRADOS, VTOS, and MULTIDOS single- or double-density formatted disks.

I tested the Arranger's capabilities by cataloging and printing out 62 disks with a total of 1,542 filenames. The disks had been created on several models, using different operating systems and densities. Track counts varied from 35 to 84.

The Arranger balked on DOSPLUS disks with 80 or more tracks, but occasionally, read the directories successfully on the second attempt. After cataloging all the disks, which took approximately a half-hour, I printed the results twice -- once alphabetically by filename and then by disk catalog number. I chose to number and enter my disks manually rather than rename them and create possible naming conflicts. The Arranger can handle it either way.

In addition to a backup utility (which should be used immediately), the Arranger offers the following features:

- Toggle mode -- enables you to switch from automatic to manual entry of the disk name or number
- Rename -- allows you to change the name of your disks for automatic read by the program
- Add -- reads and files your disk directory information
- Update -- replaces old disk information with new data
- View -- permits you to print the disks either to the monitor or the printer in alphabetic order
- Produce alpha list -- allows the viewing or printing of filenames
- Find -- searches for filenames and has a wild card capability

. Locate -- finds free granule space on your cataloged disks
. Scan -- permits you to look through individual disk directories
. Change filter -- a masking function which separatas the entire catalog by filename type, disk type, disk name or track number
. Manual add -- allows the entry of unrecognized disk formats or protected disks
. Delete -- removes all trace of a particular entry from the catalog

o SUMMARY

As you can see, the list of functions is impressive. The real question, however, is one of performance. Aside from the problem with DOSPLUS disks, the Arranger performed very well; every function operated easily and quickly. There are more than enough on-screen prompts to keep you from getting lost so that you will probably never need to read the 5-by-6-inch manual for other than a quick scan.

The Arranger has, by far, the most capacity and the best functionality I have ever encountered. I also found it to be the most efficient and easy-to-use disk catalog program. Plaudits to Dan Foy, the author, for a magnificent job. CDC Serious Software for 80's, 13715 Vanowen Street, Van Nuys, CA 91405. 213/997-9692.

* NEW COMPILER SYSTEM: COMCBAS, EDITAS, LBR

Of the many compilers for the TRS-80, this one is unique. It compiles your Basic program code into true machine code and, in the process, an interim Assembly Languaga file. The $239 package is, as its name indicates, actually three modules. It is configured for a 48K Model III with two disk drives and TRSDOS or LDOS.

o COMCBAS

This module creates the files necessary to load into the editor assembler (EDITAS). It reads your Basic source code, saves it in the regular comprassed format, and determines which assembler modules should be called up from the linking library. Although this is a two-pass process, it is very quick.

o EDITAS

After the assembly source file is created, control is transferred to EDITAS. It links your source to the appropriate modules and produces a true "CMD," stand-alone object file. This file needs no run-time modules in order to execute, and the manufacturer does not claim royalties for programs you create using their system. The assembly process is fairly long; it may consume as much as forty minutes to compile a lengthy Basic sourca fila.

Unlike most compilers now on the market that are very restrictive with regard to the commands or types of variables you can use in your Basic code, such is not the case here. Almost all standard commands are handled in the normal mannar, and compilation of files is simple and straightforward.

EDITAS can be used either with directly-entered assembly code or the linkage system. In addition to supporting many macro commands, the editor is a full-blown word processor that can be used for text as well as source code and assembly. The reault is a very comprehensive editor. In fact, the documentation for the whole system was produced with the word processing mode in EDITAS.

o LBR

The module called LBR is a utility that creates and maintains library files for data or programs. Searching through the library is made possible with the use of an EDITAS directive. Files can be saved in core image form, for burning code into EPROMS (electronically programmable read only memories). Program libraries can be executed from the DOS command level of your Model III.

(Continued on page 12)

o ADVANTAGES

Some of you may question the need for a compiler or wonder what it can do for your programs. The primary advantage, of course, is speed. To give you some idea of what this system does, I compiled more than five different types of programs with it. For benchmarking speeds, I used David Ahl's well-known Basic benchmark program (published in the March 1984 issue of Creative Computing).

The time for the benchmark test under Disk Basic on a Model III was 1 minute and 59 seconds. After being compiled with COMCBAS, the program showed a 30% improvement with no loss of accuracy. In tests involving disk input/output (a mechanical application), an increase in speed of only 10% was achieved. When using integer variables, graphics and redundant loops, speed improvements of up to 40% were noted.

If faster processing is not enough to warrant your purchasing the package, there is another advantage. The object code makes it very difficult for anyone else to modify your programs.

o DISADVANTAGES

Although complete, the documentation tends to be very technical (and filled with typographical errors). Therefore, COMCBAS is not a package for the novice or casual user, but rather for the serious or commercial programmer.

Be advised that this is a heavily copy-protected package. It is distributed on its own syatem disks which have a limited backup (three keydisks) function -- and replacement is expensive. In addition, the keydisk must be used to checksum the COMCBAS and EDITAS modules after they load into memory -- a bothersome procedure.

The compiled programs will run on only the TRSDOS and LDOS operating systems. In fact, you must stick to the system under which you compiled the code, since some operating system calls may be used in the object file. But if you work exclusively in the TRSDOS environment and don't use other operating systems, this may not be a significant disadvantage for you.

o SUMMARY

Despite these limitations, COMCBAS does offer flexibility and power. It is the best compiler of its type on the market today and is bargain-priced as a system. A demonstration disk that includes most of its capabilities is available with a manual for $13. Socrates Electronic Instruments Inc., P.O. Box 975, Portchester, NY 10573.

* FLOPPY POCKETS

Floppy Pockets is the name of a set of 12 vinyl diskette jackets that comes with a plastic disk box. It costs $7.95 (without the disk box, the price is $5.95). The jackets are available in 12 colors which enable you to develop a color-coding scheme for your diskettes. The front of the jacket has a clear pouch for a disk directory listing.

What gives me cause for concern about this product is the gas that vinyl usually releases under high temperatures -- like that emitted by vinyl auto upholstery when your car sits in the summer sun all afternoon. If this emission coats your disks, it could cause read/write errors. But as long as your disks are kept where the temperature is moderate, there would be nothing to fear. CDC Serious Software for the 80's, 13715 Vanowen St., Van Nuys, CA 91405. 213/997-9692.